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Indian Standard

SPECIFICATION FOR BORAX FOR COSMETIC INDUSTRY

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SPECIFICATION FOR BORAX FOR COSMETIC INDUSTRY

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Indian Standard

SPECIFICATION FOR BORAX FOR COSMETIC INDUSTRY

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 July 1984, after the draft finalized by the Cosmetics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 IS : 1109-1980* covers a number of grades used in a variety of industries namely, glass, ceramics, textile and leather. The persent standard has been drawn up specifically to cater to the needs of the cosmetic industry.

0.3 In keeping with the general pattern of cosmetic raw material standard specifications, a single set of requirements has been stipulated in this standard to facilitate implementation. All other changes considered necessary to align the standard with others in the series have been included.

0.4 Borax is essentially sodium tetraborate decahydrate ($Na_2B_4O_7.10H_2O$) and is used in the cosmetic industry in skin creams, lotions, shaving cream, etc.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1 SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for borax for use in cosmetic preparations.

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*Specification for borax *(second revision)*.

†Rules for rounding off numerical values *(revised)*.

2. REQUIREMENTS

2.1 Description — The material shall be in the form of hard, odourless, colourless or white crystals or crystalline powder consisting essentially of sodium tetraborate decahydrate ($Na_2B_4O_7.10H_2O$). It shall be free from visible impurities and other foreign matter. The material effloresces in dry air.

2.2 The material shall also comply with the requirements given in Table 1, when tested according to the methods prescribed in Appendix A. References to the relevant clauses of Appendix A are given in col 4 of the table.

TABLE 1 REQUIREMENTS FOR BORAX FOR COSMETIC INDUSTRY

Sl No.	Characteristic	Requirement	Method of Test (Ref to Cl No. in Appendix A)
(1)	(2)	(3)	(4)
i)	Sodium tetraborate decahydrate ($Na_2B_4O_7.10H_2O$) content, percent by mass	99·0 to 103·0	A-2
ii)	Matter insoluble in water, percent by mass, *Max*	0·01	A-3
iii)	Arsenic (as As_2O_3), parts per million, *Max*	10	A-4
iv)	Heavy metals (as Pb), parts per million, *Max*	20	A-5
v)	Iron as (Fe), percent by mass, *Max*	0·008	A-6

3. PACKING AND MARKING

3.1 Packing — The material shall be packed in well-closed, clean and dry jute bags lined with polyethylene sheets or as agreed to between the purchaser and the supplier.

3.2 Marking — The containers shall be legibly and indelibly marked with following information:

a) Name of the materials;

b) Gross and net mass in the containers;

c) Name of the manufacturer and recognized trade-mark, if any; and

d) Batch number in code or otherwise.

3.2.1 The containers may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by theprovisions of the Indian Standards Institution (Certification Mark) Act, and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4. SAMPLING

4.1 The method of drawing representative samples of the material and the criteria for conformity to the requirements of this specification shall be as prescribed in Appendix B.

APPENDIX A

(*Clause* 2.2)

METHODS OF TEST FOR BORAX

A-1. QUALITY OF REAGENTS

A-1.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be employed in tests.

NOTE — ' Pure Chemicals ' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-2. DETERMINATION OF SODIUM TETRABORATE DECAHYDRATE ($Na_2B_4O_7.10H_2O$)

A-2.0 Outline of the Method — Sodium tetraborate decahydrate ($Na_2B_4O_7.10H_2O$) is determined by titration against hydrochloric acid, using methyl red as indicator.

A-2.1 Reagents

A-2.1.1 *Standard Hydrochloric Acid* — 1 N.

A-2.1.2 *Methyl Red Indicator* — Dissolve 0·1 g of methyl red in 60 ml (*see* IS : 323-1959†) alcohol and dilute with water to 100 ml.

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*Specification for water for general laboratory use (*second revision*).
†Specification for rectified spirit (*revised*).

A-2.2 Procedure — Weigh accurately about 7 g of the material, dissolve in about 100 ml of water in a flask and titrate the solution with standard hydrochloric acid using methyl red as indicator.

A-2.3 Calculation

$$\text{Sodium tetraborate decahydrate } (Na_2B_4O_7.10H_2O), \text{ per cent by mass} = \frac{19.07\,VN}{M}$$

where

V = volume in ml of standard hydrochloric acid,

N = normality of hydrochloric acid, and

M = mass in g of the material taken for the test.

A-3. DETERMINATION OF MATTER INSOLUBLE IN WATER

A-3.1 Procedure — Disolve 20 g of the material in 300 ml of hot water and heat on a steam-bath for 1 hour. Filter any undissolved residue through a Gooch crucible or a sintered glass crucible No. G4. Wash it thrice with 50-ml portions of hot water and dry at 105°C. Cool and weigh the residue till constant mass is obtained.

A-3.2 Calculation

$$\text{Matter insoluble water, percent by mass} = \frac{100 \times M_1}{M_2}$$

where

M_1 = mass in g of the dried residue, and

M_2 = mass in g of the material taken for the test.

A-4. TEST FOR ARSENIC (AS As_2O_3)

A-4.1 Procedure — Dissolve 0·1 g of the material in 10 ml of water. Carry out the test for arsenic as prescribed in IS : 2088-1971* using for comparison a stain obtained with 0·005 mg of arsenic trioxide (as As_2O_3).

A-4.1.1 The material shall be taken to have satisfied the requirement of the test if the length and intensity of the stain is not greater than that produced in the control test.

A-5. TEST FOR HEAVY METALS

A-5.1 Apparatus

A-5.1.1 *Nessler Cylinders* — 50 ml capacity (*see* IS : 4161-1967†).

*Methods for determination of arsenic (*first revision*).

†Specification for Nessler cylinders.

A-5.2 Reagents

A-5.2.1 *Dilute Hydrochloric Acid* — approximately 1 N.

A-5.2.2 *Sodium Sulphide Solution* — Dissolve 10 g of sodium sulphide in water and make up to 100 ml. Filter and preserve in a dark coloured bottle.

A-5.2.3 *Standard Lead Solution* — Dissolve 1·83 g of A.R. grade lead acetate [Pb ($C_2H_3O_2$)$_2$. $3H_2O$] in 100 ml of water and add a few drops of acetic acid to clear any cloudiness. Dilute the solution to 1 000 ml. Take 10 ml of this solution and make it up to 1 000 ml. One millilitre of this solution contains 0·01 mg of lead (as Pb).

A-5.2.4 *p-Nitrophenol Indicator* — Dissolve 0·1 g of *p*-nitrophenol in 50 ml of rectified spirit and dilute with water to 100 ml.

A-5.2.5 *Acetic Acid* — 1 N.

A-5.3 Procedure — Dissolve 1·0 g of the material in 16 ml of water and a few drops of *p*-nitrophenol indicator. To this, add dilute hydrochloric acid till the yellow colour is discharged (approximately 6 ml). Transfer this solution to a Nessler cylinder and add 2 ml of acetic acid and 10 ml of sodium sulphide solution. Make up the solution to 50 ml. Carry out a control test in another Nessler cylinder using 2 ml of standard lead solution in place of the material and 2 ml of acetic acid and 10 ml of sodium sulphide solution and diluting to 50 ml. Shake the two Nessler cylinders well. Compare the intensity of colour produced in the two cylinders.

A-5.3.1 The limit prescribed in Table 1 shall be considered as not having been exceeded if the colour produced by the material is not greater than that obtained in the control test.

A-6. TEST FOR IRON

A-6.0 Outline of Method — Iron is determined colorimetrically by visual comparison using potassium thiocyanate.

A-6.1 Apparatus

A-6.1.1 *Nessler Cylinder* — 50 ml capacity (*see* IS : 4161-1967*).

A-6.2 Reagents

A-6.2.1 *Concentrated Hydrochloric Acid* — *See* IS : 265-1976†.

A-6.2.2 *Concentrated Sulphuric Acid* — *See* IS : 266-1977‡.

*Specification for Nessler cylinders.
†Specification for hydrochloric acid (*second revision*).
‡Specification for sulphuric acid (*second revision*).

A-6.2.3 *Ammonium Persulphate* — solid

A-6.2.4 *Butanolic Potassium Thiocyanate Solution* — Dissolve 10 g of potassium thiocyanate in 10 ml of water and make up the solution to 100 ml with *n*-butanol. Shake vigorously until the solution is clear.

A-6.2.5 *Standard Iron Solution* — Dissolve 0·702 g of ferrous ammonium sulphate [$FeSO_4$ (NH_4)$_2SO_4.6H_2O$] in water in one-litre flask, add 4 ml of concentrated sulphuric acid and dilute with water to the mark. When required for test, dilute 10 ml of this solution to 100 ml in a volumetric flask before use. One millilitre of this diluted solution contains 0·01 mg of iron (as Fe).

A-6.3 Procedure — Dissolve 1·0 g of the material in hot water, cool and transfer to a Nessler cylinder. Add 2 ml of hydrochloric acid, 30 mg of ammonium persulphate and 15 ml of butanolic potassium thiocyanate solution. Shake vigorously for 30 seconds and allow the liquids to separate. Carry out a control test in another Nessler cylinder with 8 ml of standard iron solution in place of the sample and the same quantities of other reagents in the same total volume of the reaction mixture. Compare the colour of butanol layer in the two sets.

A-6.3.1 The limit prescribed in Table 1 shall be taken as not having been exceeded if the intensity of the colour of the butanol layer in the test with the material is not darker than that produced in the control tests.

APPENDIX B

(*Clause* 4.1)

SAMPLING OF BORAX

B-1. GENERAL REQUIREMENTS OF SAMPLING

B-1.0 In drawing, preparing, storing and handling test samples, precautions and directions as directed in IS : 8883 (Part 1)-1978* shall be followed.

B-2. SCALE OF SAMPLING

B-2.1 Lot — All the packages in a single consignment containing the material of the same grade, drawn from a single batch of manufacture shall constitute a lot.

*Methods of sampling chemicals and chemical products: Part 1 General requirements and precautions.

B-2.2 For ascertaining the conformity of the material to the requirements of this specification, samples shall be tested for each lot separately. The number of packages to be selected at random from lots of different sizes shall be in accordance with Table 2.

TABLE 2 NUMBER OF PACKAGES TO BE SELECTED

Lot Size	Sample Size
N	n
(1)	(2)
Up to 50	3
51 to 150	4
151 to 300	5
301 to 500	7
501 and above	10

NOTE — When the number of packages in the lot is less than 3, sample size shall be as agreed to between the purchaser and the supplier.

B-2.3 The packages for this purpose shall be selected at random from the lot. In order to ensure randomness of selection, use shall be made of IS : 4905-1968*. In case random number tables are not available, the following procedure may be adopted:

Starting from any package, count all the packages in the lot as 1, 2, 3,... ....., up to r and so on. Every rth package thus counted shall be withdrawn to constitute the sample where r is the integral part of N/n (N being the lot size and n the sample size).

B-3. INDIVIDUAL SAMPLES AND COMPOSITE SAMPLES

B-3.1 Preparation of Sets of Individual Samples — Draw with an appropriate sampling instrument equal portions of material from different parts of each of the containers selected in **B-2.2**. The quantity of material so drawn from each container shall be sufficient to make triplicate determinations given in col 2 of Table 1. Mix these small portions of the material from the same container to obtain the sample representative of the container. Keep these representative samples from different containers separately. From each representative sample draw three equal portions of material each sufficient for carrying out the intended tests and transfer them to thoroughly clean and dry sample containers. Seal the sample containers air-tight. Thus three sets of test samples are obtained such that each set has a test sample from each selected container. One of these sets shall be reserved as a referee set.

*Methods for random sampling.

B-3.2 Preparation of Composite Sample — From each of the samples representative of the selected containers as obtained in **B-3.1,** take small and equal portions of material and mix them thoroughly to constitute a single composite sample representing the lot as a whole. Divide this composite sample into three equal parts each sufficient for carry out the intended tests and transfer them to thoroughly clean and dry sample containers. One of these composite samples shall be sent to the purchaser and one to the supplier. The third composite sample shall be reserved as a referee sample.

B-3.3 Referee Sample — A referee sample shall consist of a set of individual samples from **B-3.1** and composite sample from **B-3.2.** The referee sample shall bear the seals of the purchaser and the supplier or their authorized representatives. The referee sample shall be kept at a place mutually agreed to between the parties.

B-4. NUMBER OF TESTS

B-4.1 Tests for the determination of sodium tetraborate decahydrate and matter insoluble in water shall be carried out on each of the individual sample in a set.

B-4.2 Tests for the determination of remaining characteristics shall be performed on the composite sample only.

B-5. CRITERIA FOR CONFORMITY

B-5.1 For the characteristics tested on the individual samples, namely, sodium tetraborate decahydrate and matter insoluble in water, the average ($\bar{X}$) and the range (R) shall be calculated as follows:

where

$$\bar{X} = \frac{\text{Sum of the test results}}{\text{Number of tests}}$$

R = difference between the maximum and the minimum of test results.

B-5.1.1 The lot shall be considered to be in conformity with respect to sodium tetraborate decahydrate if $\bar{X} + 0{\cdot}6\ R$ is less than or equal to 103·0 and $\bar{X} - 0{\cdot}6\ R$ is greater than or equal to 99·0 and for matter insoluble in water $\bar{X} + 0{\cdot}6\ R$ shall be less than or equal to maximum value specified.

B-5.2 For Composite Sample — For declaring the conformity of the lot to the requirements of all the characteristics tested on the composite sample, the test results shall satisfy the corresponding specified requirements.